Caution Bulletin

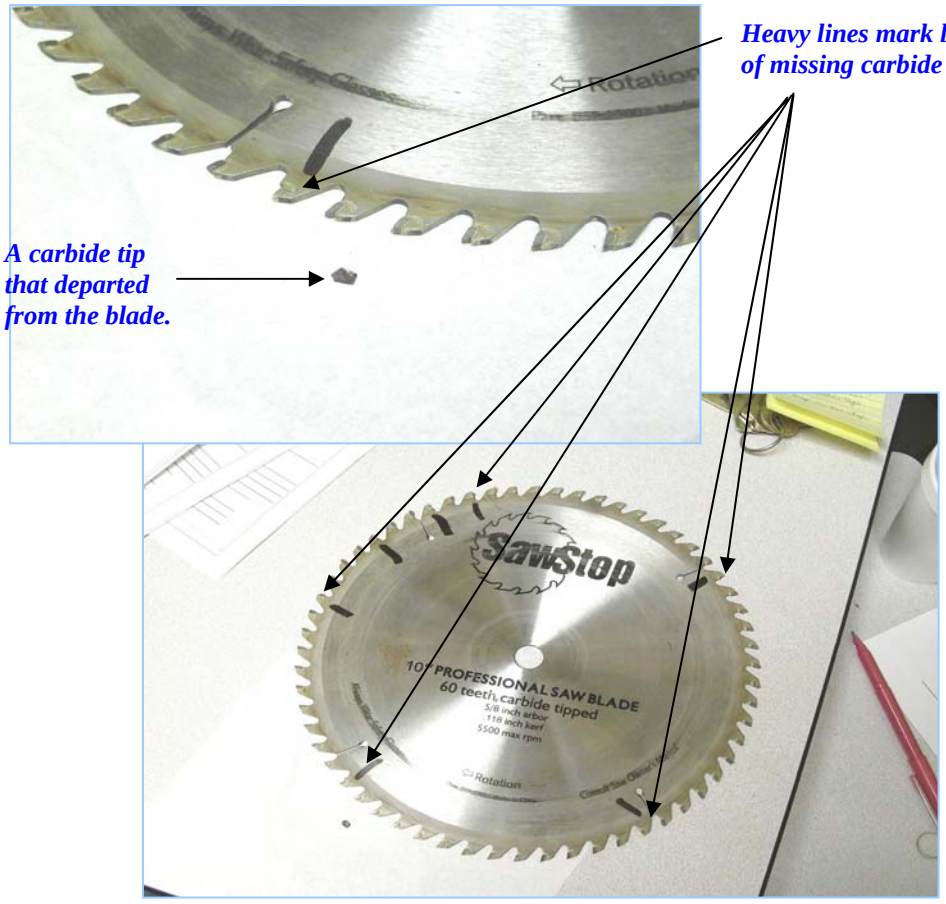
Table Saw Related Injury

November 29, 2007 2007-RL-HNF-0043 Tracking No: 770

Summary: While performing a routine task using a table saw, a carpenter was struck in the forehead by a carbide tip from the table saw blade. The most probable cause of the accident was the decision to use of a less costly table saw blade without knowing it had inferior carbide tip material. Inconsistencies in the hazards analysis lead to the incorrect use of personal protective equipment. The use of a face shield would have mitigated the injury to the carpenter.

Discussion of Activities: On September 26, 2007, a Carpenter was making a shallow reverse dado cut on a large wood drawer using a SawStop® table saw when a portion of a carbide tip on the blade of the saw broke off striking him in the forehead. The employee was immediately taken to the first aid station, where a nurse determined something had lodged under the skin. A physician extracted a piece of carbide tip from under the forehead skin and closed the wound with two stitches.

Analysis: Based on a visual inspection of the subject blade, a metallurgical engineer noted that a large number of the blade tips had failed (bottom right photo), and the failures appeared to be limited to fractures within the carbide material only. No failure was observed at the brazed interface where the carbide tip was attached to the steel blade. No failure was noted in the steel blade substrate.



Saw blades manufactured by the Amana Tool Company (made in the USA), were used on the previous table saw prior to acquisition of the SawStop® table saw in September of 2006. The Amana blades provided excellent cutting, cost approximately $100 each, and were sent out for regrinding when dull.

A 60-teeth carbide-tipped saw blade was provided with the SawStop® table saw. Although the SawStop® takes any 10-inch metal circular saw blade, the Carpenters trusted the SawStop® name; therefore, procurement of the Amana saw blades was stopped in favor of the SawStop® saw blades (made in China). With its cheap replacement cost ($20), the blade was disposed of when dull as it was not cost effective to sharpen.

The blade guard was removed to facilitate cutting a very large drawer due to its size. Inconsistencies within the Carpenter's hazards analysis listed flying objects or potential flying objects when the blade guard is removed thus requiring safety glasses, face shield, goggles, or in combination. Other sections for table saw use made no mention of flying objects or the use of a full face shield. This inconsistency allowed safety glasses to be used based upon past experience.

Recommended Actions:

- Table saw operators should mitigate the possibility of saw blade failure and the resulting flying debris by wearing a full face shield when a blade guard cannot be used to protect the operator (as occurs when making dado cuts due to the height of the material being cut).
- Hazard analysis should include provisions for additional PPE if a safety feature is defeated. Stop work whenever conditions change and result in a hazard that has not been properly analyzed. Be cognizant of scheduling demands and pressures and address safe work habits in pre-job briefings.
- Ensure that saw blades are designed for the material being cut. Use high quality tools and equipment purchased from reliable sources. Review inventories of blades, grinding wheels, drill bits, etc. checking for signs of fatigue. Perform pre-use inspections of tools to ensure proper application of wheels, bits, blades, etc.
- When making decisions to change the quality of equipment based upon cost considerations, perform an analysis to determine if there is any decrease in the safety margins associated with the change.

Cost Savings/Avoidance: Not Evaluated

Work Function: Personnel Protective Equipment, Procurement

Hazards: Personnel Injury

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References: None